# SECTION 02210

# GRADES, LINES, AND LEVELS

## PART 1 GENERAL

### 1.1 SCOPE OF WORK

#### 1.1.1 Work Included

The subcontractor will furnish all materials, labor, tools, and equipment to perform surveying. The subcontractor will perform surveying to ensure that the proper grades, lines, and levels are established as set forth in these specifications and as shown on the design drawings. The construction survey will be completed by either the subcontractor or an independent firm, provided the work is completed under the supervision of a Registered Land Surveyor in the State of Idaho.

#### 1.1.2 Related Work Specified Elsewhere

(a) Earthwork will be performed in accordance with Section 02200 of these specifications

(b) Excavation, Trenching, and Backfilling will be performed in accordance with Section 02222 of these specifications

(c) Reclamation Seeding and Mulching will be in accordance with Section 02930 of these specifications.

#### 1.1.3 Work to be Performed by Others

The contractor will:

(a) Review and approve data submittals as required by this specification

(b) Provide INEEL survey grid information

(c) Provide benchmarks, strategically located, as shown on design drawings

(d) Inspect work for compliance with the requirements of this specification in addition to inspection by the subcontractor

(e) Perform final inspection and confirm acceptance of surveying work.

### 1.2 REFERENCE DOCUMENTS

INEEL Site Grid

*Comprehensive Remedial Design/Remedial Action Work Plan for the Test Area North Operable Unit 1-10,* Selected Sites.

## 1.3 SUBMITTALS

### 1.3.1 Procedures

(a) The subcontractor will submit within eight work days after notice to proceed, a plan for the work, including descriptions of survey equipment, procedures used to establish temporary or permanent benchmarks or measurements, field notes, calculations, reductions, closures, and documentation for any benchmarks or monuments to the contractor for approval.

(b) Data will be reduced and plotted by the subcontractor in a form acceptable to the contractor. Legible notes, drawings, and reproducible documentation will be submitted to the contractor for approval. Contour intervals will be 0.5 feet. In addition to the above notes submittals, all plans will also be submitted in electronic format.

### 1.3.2 Certifications

(a) Prior to grading or placing fill at each respective site, the subcontractor will perform a survey of the existing subgrade, if necessary, to confirm to his satisfaction, the adequacy of the existing topo as shown on the drawings, and will submit a letter to the contractor stating acceptance of the accuracy of the existing topo shown on the contract drawings, or will otherwise advise of discrepancies or omissions for further resolution. Construction work in each respective area will not begin until agreement is reached on the adequacy of the existing topo information.

(b) The subcontractor will submit a letter to the contractor within four work days after completion of each respective stage of the work specified herein, verifying conformance to the requirements identified in this specification. The letter will be prepared and executed by a Professional Land Surveyor registered in the State of Idaho.

### 1.3.3 Records

The subcontractor will submit to the contractor for information, all field notes from surveying and layout activities within four work days after completion of each stage of these activities at each respective site.

## 1.4 QUALITY ASSURANCE

The subcontractor will be responsible for protecting and maintaining all horizontal and vertical control points during construction.

The subcontractor will provide an independent survey firm, registered in the State of Idaho, to verify the construction survey.

1.4.1 Accuracy

Optical survey, tape measurements, and electronic measurements will have a minimum accuracy of ± 0.1 feet in horizontal locations and elevations, or as superceded by criteria set forth in other sections of these specifications.

Calibration records will be submitted to the contractor eight work days prior to use. Calibrations will be performed by an INEEL approved calibration laboratory.

1.4.2 Tolerances

Unless superseded by other sections of these specifications, the subcontractor will survey all existing or placed materials to ensure that they are within the tolerances specified below:

| **Description** | **Tolerances** |
|---|---|
| Final Grade | -0.0 to +0.1 feet (elevation) |

## PART 2 PRODUCTS

None.

## PART 3 EXECUTION

3.1 GENERAL

3.1.1 All surveying will be performed based upon the project coordinate system for this specific project. Conversion and recording in the INEEL Site coordinate system will be performed by the contractor.

3.1.2 The surveying will be performed by a professional Land Surveyor licensed by the State of Idaho.

3.1.3 The subcontractor will check and verify that as-built thicknesses and elevations match those shown on the design drawings based on the benchmarks, and provide complete as-built information by topographic plats and by marking up prints of the design drawings.

3.1.4 The subcontractor is responsible for controlling lift thickness to ensure conformance to the required dimensions. The subcontractor will be responsible for establishing, recording, protecting, and maintaining all permanent and temporary horizontal and vertical control benchmarks.

3.2 SURVEY MEASUREMENTS

3.2.1 Prior to commencement of construction work, the subcontractor will establish survey control points inside the work areas.

3.2.2 Survey control points will be established so that any point within the job site can be accurately reestablished and elevations be obtained to the required tolerances at any time during the construction. The subcontractor will verify all baselines, and horizontal and vertical control benchmarks stipulated in the information provided by the contractor.

3.3 ACCEPTANCE

1) Surveying work not in accordance with the requirements of this specification will be corrected, repeated, or replaced by the subcontractor. The subcontractor will submit a description of the corrective action methods to the contractor for approval before use. Acceptance criteria for corrected actions will be in accordance with the original requirements of this specification.

2) In the event of a survey discrepancy, the area in question will be resurveyed and verified at no cost to the contractor.

END OF SECTION

# SECTION 02222

# EXCAVATION, TRENCHING, AND BACKFILLING

## PART 1 GENERAL

### 1.1 SCOPE OF WORK

#### 1.1.1 Work Included

The subcontractor will furnish all materials, labor, tools, and equipment to complete excavation, trenching, and backfilling necessary during the construction activities, including excavation, trenching, and backfilling for constructing ditches, swales, and test pits.

#### 1.1.2 Related Work Specified Elsewhere

(a) Temporary Diversion and Control of Water During Construction will be in accordance with Section 02140 of these specifications

(b) Earthwork will be performed in accordance with Section 02200 of these specifications

(c) Reclamation Seeding and Mulching will be in accordance with Section 02930 of these specifications.

#### 1.1.3 Work to be Performed by Others

The contractor will:

(a) Review and approve data submittals as required by this specification

(b) Have the option to perform final inspection and acceptance of excavations, trenches, and backfilling.

### 1.2 REFERENCE DOCUMENTS

Occupational Safety and Health Administration (OSHA)

29 CFR, Part 1926, Subpart G, Signs, Signals, and Barricades
29 CFR, Part 1926, Subpart P, Excavation, Trenching, and Shoring
Pamphlet 2226, Excavation and Trenching Operations.

INEEL Health, Safety and Hazards Prevention Documents

Health and Safety Plan (HASP) for the Remedial Action of Waste Area Group 1, Operable Unit 1-10.

Hazards Prevention and Control Document, PRD-24.

*Comprehensive RD/RA Work Plan for the Test Area North OU 1-10,* Selected Sites.

1.3 SUBMITTALS

1.3.1 Certifications

The subcontractor will submit a letter to the contractor verifying conformance to the requirements identified in this specification within four work days after completion of the work specified herein.

1.3.2 Records

The subcontractor will submit to the contractor for information, all field notes from excavation, trenching, and backfilling activities within four work days after completion of each stage of these activities at each respective site.

1.4 QUALITY ASSURANCE

The subcontractor will prepare, maintain, and use a contractor-approved, written Quality Assurance/Quality Control Manual for the work performed. The Quality Assurance/Quality Control Manual will be submitted within eight work days after notice to proceed, and will include the requirements to ensure application of the latest design documents and the incorporation of the approved changes. As a minimum, the subcontractor will develop and maintain appropriate records that verify the quality and acceptance of materials, the application of approved procedures, the test and inspection records, and the appropriate approval signatures for acceptance of work performed.

## PART 2 PRODUCTS

2.1 EQUIPMENT AND MATERIAL REQUIREMENTS

2.1.1 Backfill Material

Backfill material may be any type of clean fill material that is accessible at Test Area North.

2.1.2 Excavated Material

The subcontractor will excavate and handle excavated material regardless of its type, characteristic, composition, or depth condition. All material excavated from trenching operations will be stockpiled in designated areas for eventual reuse.

## PART 3 EXECUTION

3.1 PROTECTION, SAFETY AND HAZARDS PREVENTION

3.1.1 The subcontractor will comply with the rules and regulations of OSHA Construction Safety and Health Regulations 29 Code of Federal Regulation (CFR), Part 1926, Subpart P, Excavation, Trenching, and Shoring, and the HASP. The subcontractor will refer to OSHA Pamphlet 2226, Excavation and Trenching Operations, as an additional aid. The

subcontractor will comply with the rules and regulations of OSHA Construction Safety and Health Regulations 29 CFR, Part 1926, Subpart G, Signs, Signals, and Barricades.

3.1.2 During excavation and trenching operations, a representative of the subcontractor will be present at all times to observe the activities and identify any areas requiring investigation. Areas where undefined pipes, utilities, or any soils of peculiar nature are encountered during excavation and trenching will be brought to the immediate attention of the contractor.

3.1.3 The subcontractor will comply with Hazards Prevention and Control Document, PRD-24.

3.2 EXISTING UTILITIES

3.2.1 There are existing utilities within the limits of or nearby the construction area, as shown on the design drawings. The subcontractor will excavate in accordance with the General Conditions.

If excavation is within a minimum distance specified by the contractor of any existing high voltage or high hazard electrical power utility (whether underground, overhead, or at the side of the excavation), Lockout/Tagout or proper preparation will be required. The Subcontractor will provide at least four-work day notice to the contractor so that the contractor can arrange for and perform Lockout/Tagout procedures.

3.2.2 The subcontractor will immediately notify the contractor of any existing utilities encountered during excavation that are not indicated on the design drawings.

3.2.3 The subcontractor will obtain written approval from the contractor before backfilling for existing pipes to be removed or for other existing utilities.

3.3 GENERAL REQUIREMENTS FOR EXCAVATION

3.3.1 The subcontractor will be solely responsible for the safety of temporary cuts and fills.

3.3.2 The subcontractor will contain excavation operations within the designated limits as indicated on the design drawings. If conditions encountered warrant modification to the designated limits, the contractor will be notified prior to proceeding.

3.3.3 The subcontractor will backfill temporary excavations as soon as practical.

3.3.4 Work in inclement weather will be performed at the subcontractor's risk. The subcontractor will replace and rework any materials that become unsuitable as the result of work performed during inclement weather.

3.3.5 The subcontractor will perform excavation and fill operations in a manner that maintains drainage and control at all times, in accordance with Section 02140, Temporary Diversion and Control of Water During Construction.

(a) The subcontractor will excavate in a manner so that the site and immediately surrounding areas will be continually drained away from the excavation. Surface water run-on will not be permitted to accumulate in the excavations.

(b) When ruts of two inches or more in depth are formed, the surface will be reworked with discs, and rerolled, returned to grade, and retested by the subcontractor at the direction of the contractor. In no case will the subcontractor place any fill materials on an unstable muddy surface.

3.4 TRENCH EXCAVATION

During excavation to remove and/or plug existing pipes, materials and equipment will be handled in a manner that prevents overloading trench banks, slides, or cave-ins.

3.5 BACKFILLING

The subcontractor will not commence backfilling until the excavation work has been approved by the contractor. The subcontractor will place backfill in maximum six-inch compacted lifts. If the subcontractor cannot attain the compaction densities required, the material will be reworked to obtain the required compaction density.

3.6 TESTING

3.6.1 General

The subcontractor will be responsible for the performance of all testing. The subcontractor will submit all test records to the contractor. The degree of compaction will be expressed as a percentage of the maximum dry density obtained in accordance with American Society for Testing and Materials (ASTM) D 698.

3.6.2 Compaction Requirements

In-Place densities will be determined in accordance with ASTM D 2922.

The subcontractor will compact backfill to 95 percent of maximum dry density for all trench areas crossing under access roads or areas expected to receive vehicular traffic.

The subcontractor will compact backfill to 90 percent the maximum dry density for all other areas.

The subcontractor will perform a minimum of one field compaction test for each trench for alternate lifts. More frequent compaction tests may be required initially or upon a change in material in order to establish the compaction method and materials.

3.7 INSPECTION

3.7.1 The subcontractor will be responsible for in-process inspection during performance of all work.

3.7.2 In addition to inspection by the subcontractor, the contractor reserves the right to inspect all work for compliance with the requirements of this specification.

3.8 ACCEPTANCE

Excavation, trenching, and backfilling not in accordance with the requirements of this specification will be repaired or replaced by the subcontractor. The subcontractor will

submit a description of the repair and/or replacement methods for work not in compliance with this specification to the contractor for written approval before use. Acceptance criteria for repaired and/or replaced excavations, and backfilling will be in accordance with the original requirements of this specification.

END OF SECTION

# SECTION 02930

# RECLAMATION SEEDING AND MULCHING

## PART 1 GENERAL

### 1.1 SCOPE OF WORK

#### 1.1.1 Work Included

The subcontractor will furnish all labor, materials, labor, tools, and equipment, and place seed and mulch in accordance with this specification and as indicated on the design drawings. This section describes the subcontractor's requirements to provide a final vegetated surface in those areas designated herein or as shown on the drawings. These designated areas will be seeded and mulched as set forth in this section and on the design drawings.

#### 1.1.2 Related Work Specified Elsewhere

(a) Temporary Diversion and Control of Water During Construction will be in accordance with Section 02140 of these specifications

(b) Earthwork will be performed in accordance with Section 02200 of these specifications

(c) Excavation, Trenching, and Backfilling will be in accordance with Section 02222 of these specifications.

#### 1.1.3 Work to be Performed by Others

The contractor will:

(a) Review and approve data submittals as required by this specification

(b) Have the option to inspect equipment, work, and materials for compliance with the requirements of this specification, in addition to inspection by the subcontractor

(c) Have the option to review preseeding conditions and other related job conditions during performance of the work

(d) Have the option to perform inspection and acceptance of the final vegetated surfaces.

### 1.2 REFERENCE DOCUMENTS

United States Department of Agriculture (USDA)

Federal Seed Act

State of Idaho

Idaho Pure Seed Law, Chapter 4, Title 22, Idaho Code

*Comprehensive RD/RA Work Plan for the Test Area North OU 1-10,* Selected Sites.

1.3 SUBMITTALS

1.3.1 Procedures

The subcontractor will submit a Seeding and Mulching Plan to the contractor for written approval within eight work days after notice to proceed. The plan will describe the methods of placement and the equipment to be used during operations.

1.3.2 Certifications

(a) The subcontractor will submit eight work days prior to use, the seed vendor's certified statement for the seed mixture required, stating scientific and common names, percentages by weight, and percentages of purity and germination. The subcontractor will submit a signed statement certifying that the seed is from a lot that has been tested by a recognized laboratory for seed testing within six months prior to the date of delivery to the construction site.

(b) The subcontractor will submit a letter to the contractor verifying conformance to the requirements identified in this specification within four work days after completion of the work specified herein.

1.3.2 Records

The subcontractor will submit records of inspection to the contractor within four work days after completion of the inspection.

## PART 2 PRODUCTS

2.1 GENERAL

Seed, fertilizer, mulch, and equipment will be inspected upon arrival at the job site by the contractor for conformity to type and quality in accordance with these requirements. Unacceptable materials will be removed from the job site by the subcontractor.

2.2 EQUIPMENT AND MATERIAL REQUIREMENTS

2.2.1 Seed Mix

Seed will be labeled in accordance with United States Department of Agriculture rules and regulations under the Federal Seed Act and Idaho Pure Seed Law. Seed will be furnished in sealed bags or containers clearly labeled to show the name and address of the supplier, the seed name, the lot number, net weight, origin, the percentage weed seed content, the guaranteed percentage of purity and germination, pounds of live seed (PLS) of each seed species, the total pounds of live seed in the container, and the date the of the last germination test that will be within a period of six months prior to commencement of

planting operations. Seed will be from a current or previous year's crop. Each variety of seed will meet the requirements of the Idaho Pure Seed Law.

The following seed mixture will be used:

| Species | (lb/acre purer live seed) |
|---|---|
| Streambank wheatgrass | 5 |
| Needle and Thread | 5 |
| Lewis flax | 1 |
| Milkvetch | 0.5 |
| False Alfalfa | 0.5 |
| Wyoming big sage brush | 0.25 |
| Winterfat | 0.25 |

2.2.2 Fertilizer

A starter fertilizer containing nitrogen, phosphorous, potassium, and sulfur will be used. A 20-48-10 or contractor approved equal will be acceptable.

2.2.3 Mulch

The subcontractor will furnish all labor, materials, tools, and equipment to place a grain straw (wheat, oats, or barley) mulch on the reclaimed areas.

2.2.4 Equipment

The subcontractor will provide appropriate types of equipment for the performance of drill seeding and mulch spreading. Seeding of the grass species will be done with a rangeland grass drill equipped with multiple seed bins, depth bands, and press wheels. Drills should have agitators to prevent the seed from segregating and lodging in the seed box. The depth bands should be suitable for placing the seed at a depth that does not exceed ½ inch.

Mulch crimping equipment will properly crimp straw without cutting the straw. Discing equipment is not acceptable.

2.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

2.3.1 Delivery

The subcontractor will deliver seed to the site in the original, unopened containers bearing the container labels or tags stating the producer's guaranteed statement of analysis.

2.3.2 Storage

Material will be stored in areas designated by the contractor. Seed will be stored in cool, dry locations away from contaminants and in accordance with manufacturer's recommendations. Storage times will not exceed manufacturer's recommendations.

2.3.3 Handling

Except for bulk deliveries, the subcontractor will not drop or dump materials from vehicles.

## PART 3 EXECUTION

3.1 APPLICATION PROCEDURES

3.1.1 Topsoil Preparation

Prior to seeding, the subcontractor will till the top three inches of the surface into an even and loose seed bed, free of clods in excess of four inches in diameter, and brought to the desired line and grade. The areas to be planted will be free of rills and gullies. All roots larger than one in diameter, litter, and other foreign material will be removed from the area and disposed by the subcontractor.

3.1.2 Seeding

(a) The subcontractor will seed remediation areas, laydown areas, borrow areas, and other locations impacted by construction activities.

(b) The subcontractor will apply the seed mix uniformly to the prepared surface by means of drill seeding at the minimum rate specified in Part 2.2.1 of this section.

(c) Seed will be uniformly drilled to a maximum depth of ½ inch using equipment specified in Part 2.2.4 of this section.

(d) The subcontractor will seed in a pattern perpendicular to the slope, working from the top of the slope down and using row markers to indicated seeded areas.

(e) The subcontractor will seed the grass mixture in either the Spring or the Fall. Where feasible, seeding should be done between October 15 and November 15 for optimum results. Spring seeding will be done after the chances of freezing temperatures have passed. Fall seeding will be done before the ground is frozen or covered with snow and before the time that temperatures would be too low for germination.

(f) The stand of grass resulting from the seeding will not be considered satisfactory until accepted by the contractor. Subcontractor will provide a one year warranty to assure the stand of grass from the seeding. If areas are determined to be unacceptable, the unacceptable areas will be reseeded in accordance with these specifications.

3.1.3 Fertilizer

Fertilizer will be applied at the rate of 30 pounds per acre.

3.1.4 Mulch

Mulch will be straw spread uniformly at a rate of two tons per acre immediately following seeding. Mulch will be anchored into the soil to a depth of at least two inches

with no more than one pass of the crimping equipment. Mulching will not be performed when wind interferes with placement.

3.2 MAINTENANCE

3.2.1 General

(a) Maintenance during all construction operations will be provided by the subcontractor

(b) Areas damaged by man-made or natural causes, will be restored to the original conditions of this specification by the subcontractor.

3.2.2 Inspections

(a) The subcontractor will perform daily inspections of previously seeded areas during the reclamation activities. The inspection records will be submitted weekly to the contractor.

(b) All inspection findings will be submitted to the contractor in writing including, but not limited to, conditions observed, repairs recommended, and materials recommended. The subcontractor is required to submit a repair report documenting the repairs made and material used.

3.2.3 Warranty

The warranty period will be the Contract Documents. Areas of erosion will be immediately repaired and reseeded by the subcontractor throughout the warranty period or until an acceptable grass stand is established and accepted by the contractor.

3.3 ACCEPTANCE

Seeding and mulching not in accordance with the requirements of this specification will be repaired and/or replaced by the subcontractor. The subcontractor will submit a description of the repair and/or replacement methods to the contractor for written approval before use. Acceptance criteria for repaired and/or replaced seeding or mulching will be in accordance with the original requirements of this specification.

END OF SECTION

# Appendix C

# Quality Level Evaluation

414.02
11/10/98
Rev. 02

# QUALITY LEVEL DESIGNATION AND RECORD

Quality Level Evaluation Performed By: Craig Reese Date: 7/21/00

Facility/Structure/System: TAN RD/RA (OU 1-10) Select Sites Quality Level: 3

| IDENTIFICATION OF ITEM | QUALITY LEVEL DESIGNATION | TECHNICAL JUSTIFICATION |
|---|---|---|
| RD/RA SAMPLING AT OU 1-10 | 3 | PRELIMINARY HAZARDS ANALYSIS |
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Note: Assign and record quality level in accordance with MCP-540, and obtain appropriate approvals. Completed and approved form becomes a quality assurance record. (Master Equipment List may be used as a Q-List.)

| Quality Assurance Concurrence Printed/Typed Name | Quality Assurance Concurrence Signature | Date |
|---|---|---|
| | | 8-21-2000 |
| **Facility/Program/Project Approval Printed/Typed Name** | **Facility/Program/Project Approval Signature** | **Date** |
| | | 7-21-00 |